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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,825	09/25/2003	Chang Auck Choi	5882P053	6888

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EXAMINER

SCHILLINGER, LAURA M

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,825

Applicant(s)

CHOI ET AL.

Examiner

Laura M. Schillinger

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-26 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21 and 23-25 is/are rejected.
- 7) ☒ Claim(s) 22,26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/22/04, 9/25/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 13-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected claims, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/3/06.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21, 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Flanders ('059).

Flanders ('059) teaches the following claimed limitations as cited below:

21. (original) A method of manufacturing a tunable wavelength optical filter, comprising the steps of:

- (a) forming a sacrificial oxide film (110) for floating a mirror (140) on a semiconductor substrate (100);
- (b) sequentially laminating conductive silicon films and oxide films for defining a mirror region on said sacrificial oxide film in a multi-layer and laminating another conductive silicon film to form a mirror (Col.s 3-4, lines:64-6);

Art Unit: 2813

(c) etching the rear side of said semiconductor substrate to form an opening for inserting an optical fiber thereinto (101);

(d) forming electrode pads for controlling the gap between the mirrors by an electrostatic force (104/106);

(e) etching the silicon film around said mirror in a dry etching method to expose said sacrificial oxide film, such that said mirror is suspended by a connecting means (Col.5-6, lines: 59-6); and

(f) etching said sacrificial oxide film such that said mirror is floated on said semiconductor substrate (Col.5-6, lines: 59-6) wherein two semiconductor substrate formed by said steps (a) to (f) are prepared and are attached to each other through a spacer layer therebetween so that the mirrors of said semiconductor substrates are opposite to each other (17) (Fig.1).

23. (original) The method of manufacturing the tunable wavelength optical filter according to claim 21, wherein said silicon film is formed so as to have a thickness of $(2m+1) \lambda/4n$ ($m=0, 1, 2, \dots$), wherein λ is the wavelength of the light source, and n is the optical refractive index of the silicon film. (Because the mathematical relationship contains multiple variables which can be any amount, the relationship can be manipulated to reflect any thickness of an oxide film- since Flanders teaches the existence of an oxide film thickness- the claims are anticipated)

24. (original) The method of manufacturing the tunable wavelength optical filter according to claim 21, wherein said oxide film is formed so as to have a thickness of $(2m+1) \lambda/4n$ ($m=0, 1, 2, \dots$), wherein λ is the wavelength of the light source, and n is the optical refractive index of the oxide film. (Because the mathematical relationship contains multiple variables which can be any

amount, the relationship can be manipulated to reflect any thickness of an oxide film- since Flanders teaches the existence of an oxide film thickness- the claims are anticipated)

25. (original) The method of manufacturing the tunable wavelength optical filter according to claim 21, further comprising the step of forming thermal oxide films on the both sides of the semiconductor substrate, before forming said sacrificial oxide film (Col.4, lines: 5-20).

Claim Rejections - 35 USC § 103

Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flanders ('059).

Claims 23 and 24 are recited below:

23. (original) The method of manufacturing the tunable wavelength optical filter according to claim 21, wherein said silicon film is formed so as to have a thickness of $(2m+1) \lambda/4n$ ($m=0, 1, 2, \dots$), wherein λ is the wavelength of the light source, and n is the optical refractive index of the silicon film.

24. (original) The method of manufacturing the tunable wavelength optical filter according to claim 21, wherein said oxide film is formed so as to have a thickness of $(2m+1) \lambda/4n$ ($m=0, 1, 2, \dots$), wherein λ is the wavelength of the light source, and n is the optical refractive index of the oxide film.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Flanders to include an oxide thickness as provided by the Applicant,

because the relationship described by the mathematical formula contains multiple variable which are not limited and can be an amount, therefore such a relationship can be used to express any oxide thickness.

Allowable Subject Matter

Claims 21 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Flanders ('059) teaches the method of claim 21, however fails to teach nor suggest the limitations of claim 22, which recites, "The method of manufacturing the tunable wavelength optical filter according to claim 21, wherein said sacrificial oxide film is etched by a wet etching method using a hydrogen fluoride solution or a gas phase etching method using anhydrous hydrogen fluoride which the etching speed of the sacrificial oxide film is quicker than that of the silicon film." The Examiner notes further that Flanders et al ('880) teaches the use of HF to roughen the wafer surface, however this does not anticipate nor render Applicant's claim language obvious because it does not teach to use HF to etch the sacrificial oxide film as claimed.

Moreover, Flanders ('059) teaches the method of claim 21, however fails to teach nor suggest the details recited by claim 26, which recites: 26. (original) The method of manufacturing the tunable wavelength optical filter according to claim 21, said the step (b) comprises the steps of:

Art Unit: 2813

depositing a first conductive silicon film on said sacrificial oxide film, depositing a first oxide film on said first silicon film and patterning the first oxide film to define a mirror region; depositing a second silicon film on said first silicon film and said patterned first oxide film; depositing a second oxide film on said second silicon film and patterning the second oxide film to define the mirror region; forming a third conductive silicon film on said second silicon film and said patterned second oxide film. Therefore claim 26 also contains allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Laura M. Schillinger', with a large, stylized flourish at the end.

Laura M Schillinger
Primary Examiner
Art Unit 2813

Application/Control Number: 10/671,825

Page 7

Art Unit: 2813

04/01/06